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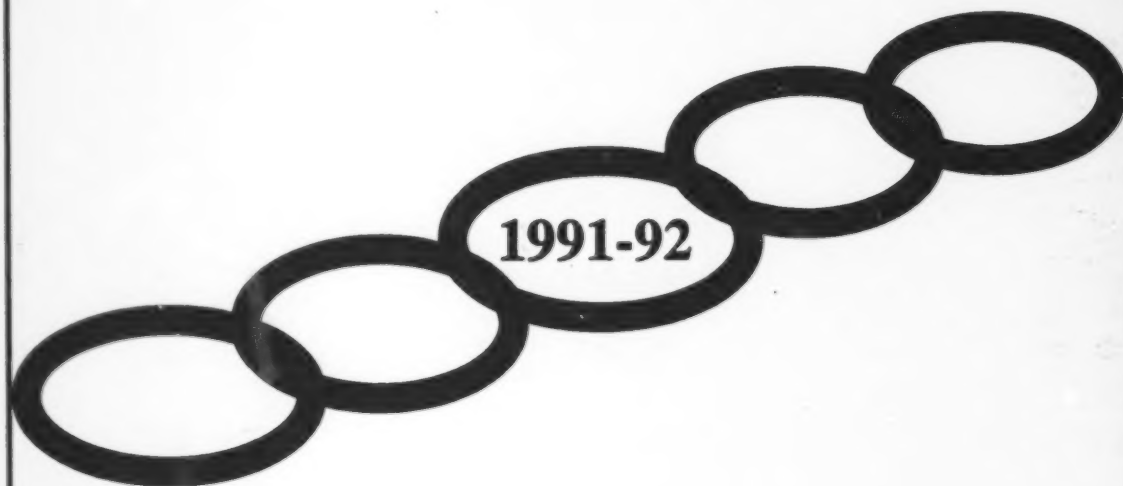
## ABSTRACT

This document describes Project A+, a cooperative school and privately funded program designed to assist the Austin Independent School District (AISD) in becoming an exemplary school district by the year 2000. The project is divided into four components. The curriculum development component presents three new curricula piloted in AISD schools in 1990: The Biological Sciences Curriculum Study, Science for Life and Living; Planet Earth; and Nonpoint Source Pollution. The staff development component describes three training institutes offered to train teachers in technology and in curriculum development: the Technology Institute; The Biological Sciences and Curriculum Development Institute; and the River Watch Institute. The student participation component conducted outreach activities with the students of teachers who attended the training institutes. The final component is a private sector partnership formed with local corporations and institutions of higher learning in order to fund the activities. Contributions by the private sector and pending grants are included in the report. (MDH)

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ED357969

# FORMING LINKAGES AND PRIVATE SECTOR PARTNERSHIPS



THE NATIONAL SCIENCE  
FOUNDATION GRANT  
TO  
THE SCIENCE ACADEMY  
OF AUSTIN

March 1992

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Office of Educational Research and Improvement  
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# Forming Linkages and Private Sector Partnerships:

The National Science Foundation Grant to  
The Science Academy of Austin 1991-92

## Executive Summary

Austin Independent School District  
Department of Management Information  
Office of Research and Evaluation

Author: Lydia Williams-Robertson

### Program Description

The Austin Science and Mathematics Consortium, funded by a four-year grant from the National Science Foundation (NSF) was implemented beginning in 1990-91 within the framework of Project A+. This project is the result of a partnership between AISD and IBM to assist AISD in becoming a world class school district by the year 2000. As a part of this effort the goals of the consortium are:

- To improve the skills of teachers (K-12) in science and mathematics by providing training for more effective and comprehensive application of technology tools available but underutilized in today's classrooms, and
- To increase student learning and performance in science concepts through more holistic, interdisciplinary approaches to teaching, and expanded opportunities to apply these concepts in real-world settings.

To address these goals, the NSF grant activities are divided into four components.

**Private Sector Involvement:** By forming partnerships with local corporations and institutes of higher education, the Science Academy and AISD are able to make use of resources not otherwise available. Private sector participants donated equipment for use by the Science Academy and other schools, provided valuable technical assistance and advice, in-kind donations, assistance in grant writing, and internships for Science Academy students.

Private sector involvement was so extensive that it is being examined in detail in this report. A previous publication, Training, Technology, and Curricula for Tomorrow's Classrooms: The National Science Foundation Grant to the Science Academy of Austin, 1991-92 Interim Report (ORE Pub. No. 90.37) details the implementation of the next three components of this grant.

**Curriculum Development:** In the fall of 1990, three new curricula were piloted in AISD schools:

- The Biological Sciences Curriculum Study (BSCS) Science for Life and Living,
- Planet Earth, and
- Nonpoint Source (NPS) Pollution.

**Staff Development:** During the summer of 1991, three training institutes were held for selected teachers to receive training in technology and in curriculum development:

- The Technology Institute,
- The BSCS Training Institute, and
- The River Watch Institute.

**Student Participation:** Science Academy students conducted outreach activities with the students of teachers who attended the training institutes during the summer of 1991.

### Major Findings

1. During the first year of the grant, linkages were formed between AISD and the following: (pg. 2, 4-9)

- 18 Local companies and businesses,
- 11 City and State agencies and organizations,
- 2 National agencies,
- 3 Institutions of higher education, and
- 5 School districts.

2. Donations reached \$ 57,799 in this first year. These donations took the form of: (pg. 4, 7, 10)

- In-kind donations,
- Computer hardware and software,
- Water quality monitoring equipment and supplies, and
- Supplemental funding to provide stipends for curriculum writers.

3. The Lower Colorado River Authority has increased its partnership donation from \$60,000 (1990-91) to \$108,000 (1991-92). (pg. 8)

4. The Texas Education Agency used the scope and sequence of the NPS Curriculum as an example of the new thematic approach to science education. The Texas Water Commission has expressed interest in disseminating the curriculum statewide. (pg. 7)

5. In partnership with various agencies and organizations, Science Academy staff participated in the writing or development of 10 grants and/or grant proposals totaling \$1,031,700. (pg. 9-10)

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## Forming Linkages and Private Sector Partnerships: The National Science Foundation Grant to The Science Academy of Austin 1991-92

### INTRODUCTION

The National Science Foundation Grant to the Science Academy of Austin focuses on the issues of technology, curriculum, and partnerships with the private sector. This report will focus on the latter, reporting the linkages formed with both higher education and private sector corporations. Through these linkages, the Science Academy (and AISD) has been able to acquire equipment, grants, and technical advice and assistance from local corporations and institutes of higher education. A previous publication, Training, Technology, and Curricula for Tomorrow's Classrooms: The National Science Foundation Grant to the Science Academy of Austin, 1991-92 Interim Report (ORE Pub. No. 90.37) examines the technology and curriculum components of the grant.

#### The Science Academy and the Private Sector

The Science Academy of Austin has a long history of partnership with the private sector. In 1983, IBM and AISD formed a task force to explore the possibility of developing a magnet school with a science and technology program. In 1985, the Science Academy opened with an enrollment of approximately 200 students who had an interest in science, mathematics, and technology and who met the Science Academy's high academic standards.

#### Project A+

In 1989, IBM and AISD formed a new partnership called Project A+. A promotional brochure described the aims of this partnership as follows.

"The future belongs to the educated, those citizens who are prepared to meet the changes and challenges of the future.

Project A+ is an AISD/IBM initiative established to marshal community resources to ensure a quality educational environment.

Such an environment includes a system of excellence, equity, and compassion in which students develop to the full extent of their abilities."

The primary goals of Project A+ are to assist AISD in becoming a world class school district by the year 2000, and to develop programs that can be replicated in other school districts. It was within the framework of Project A+ that the NSF grant to the Science Academy was implemented.

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## THE SCIENCE ACADEMY ADVISORY BOARD

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An Advisory Board composed of representatives from local corporations, The University of Texas at Austin, Austin Community College, and AISD was formed in 1983. The Board provides assistance and consultation in program and curriculum development, planning staff development, and program evaluation. The Board also facilitates donations of laboratory and computer equipment.

**Vaughn Aldridge**  
AT&T Long Distance Company

**Marvin Applewhite**  
Texas Instruments Incorporated

**Robert Backlund**  
3M Corporation (Retired)

**H. David Balfour, Ph.D.**  
Radian Corporation

**Ruben Betancourt**  
Abbott Laboratories

**W. H. Brader, Ph.D.**  
Texaco Chemical Company (Retired)

**Gerald Briney**  
IBM Corporation (Retired)

**Frank Crawley, Ph.D.**  
The University of Texas at Austin

**Exalton Delco, Ph.D.**  
Austin Community College

**Lester Formby**  
Motorola Corporation

**Rudy Garza**  
S. A. Garza, Engineers

**Jim B. Hensley, Ph.D.**  
Austin Independent School District

**Milton Lee**  
City of Austin

**Paul Leeke**  
3M Corporation

**Glynn Ligon, Ph.D.**  
Austin Independent School District

**Laura Meely**  
Lockheed Corporation

**R. A. Moeser**  
Arnold Menn and Associates

**George More III**  
George More Investments

**Peter Palazzari**  
IBM Corporation

**Frank Peters**  
MCC Corporation

**James Rutledge, Ph. D.**  
Sematech Corporation

**Ron Shelly**  
Texas Instruments Incorporated

**Sue Sinkin-Morris**  
Science Academy of Austin

**Ed Thomas**  
CompuAdd

**Bill Walling**  
Southwestern Bell Telephone Company

**Charles Warlick, Ph.D**  
The University of Texas at Austin

**Ernest L. Yeakey, Ph.D.**  
Texaco Chemical Company

**Sam Zigrossi**  
IBM Corporation

## PROGRAM DESCRIPTION

The Austin Science and Mathematics Consortium, funded by a four-year grant from the National Science Foundation (NSF), was implemented in AISD within the framework of Project A+. The Consortium, launched in January 1991, has two basic goals:

- To improve the skills of teachers (K-12) in science and mathematics through more effective and comprehensive application of technology tools available but underutilized in today's classrooms, and
- To increase student learning and performance in science concepts through more holistic, interdisciplinary approaches to teaching and expanded opportunities to apply concepts in real world settings.

To address these goals, the project is divided into four components:

**Curriculum Development:** Innovative new curricula were developed and/or piloted in AISD beginning in the fall of 1991.

- The Biological Sciences Curriculum Study (BSCS) Science for Life and Living, a new curriculum for primary grades,
- The Planet Earth, a tenth-grade science curriculum, and
- The Nonpoint Source Pollution, a science curriculum for seventh and eighth grades.

**Staff Development:** Teachers recruited from all over the District attended workshops during the summer of 1991 to receive training in technology and implementation of new curricula.

- Technology Institute: Teachers were exposed to new technology and learned to integrate this technology into their classrooms.
- BSCS Institute: Teachers (K-2) from Becker and Harris Elementary Schools received training in implementing the BSCS curriculum in their classrooms.
- River Watch Institute: Teachers (K-12) recruited from the 10-county Colorado river area received training in river monitoring techniques and environmental action planning.

**Student Participation:** Beginning in the fall of 1991, Science Academy students conducted outreach activities with the students of those teachers who attended one of the summer institutes and indicated interest in participating. Students whose teachers attended the River Watch Institute were trained by these teachers forming monitoring teams to carry out river monitoring and environmental action planning throughout the year.

**Private Sector Involvement:** By forming partnerships with the local corporations and institutes of higher education, the Science Academy and AISD were able to utilize resources not otherwise available. Participants from private sector companies and organizations are extensively involved in all aspects of the grant.

- Scientists, technologists, and engineers from the private sector served as trainers at the summer institutes and participated in follow-up activities.
- Technical Advisory Committees were formed with representatives from local corporations, the Lower Colorado River Authority (LCRA), and The University of Texas at Austin faculty to assist in the development of the new curricula.

## THE TECHNOLOGY INSTITUTE

The Technology Institute was a training workshop held during the summer of 1991 to expose teachers to new technology and to train them in integrating this technology into their classrooms. Participants from IBM, Computerland, and The University of Texas at Austin provided training and materials. The following individuals participated in planning the content of the workshops:

John Berry  
Wesley Halverson, Ph.D.  
Ron Lehman  
Sue Sinkin-Morris  
Lynn Virta

Educational Sales (K-12), Computerland  
NSF Project Facilitator/Teacher, Science Academy  
Manager /Project A+, IBM  
Director, Science Academy  
Staff Programmer, IBM

### IBM Partnership

**IBM Coordinator**  
**Technical Consultant**

Ron Lehman, IBM, Manager/Project A+  
Lynn Virta, Staff Programmer, IBM

#### IBM Workshop trainers

Ann Chlapek  
Carl Guesler  
Robin Lingren  
Daniel Scott  
Molly Worthington

Educational Consultant, IBM  
Account Systems Representative, IBM  
Multimedia Specialist, IBM  
Systems Engineer, Computerland  
Educational Consultant, IBM

### Apple Partnership

**Apple Coordinator**  
**Apple Workshop Trainer**

John Berry, Educational Sales (K-12), Computerland  
Lucy Cochran, Education Solutions Specialist, Computerland

### The University of Texas Partnership

**Workshop Trainer**

Gail Carmack, Ph.D. student, Instructional Technology, The University of Texas at Austin

### Donations

- Two IBM printers, one each to Becker and Harris Elementary Schools, valued at \$900 (total)
- 12 IBM computers to Becker and Harris Elementary teachers who participated in the BSCS training, valued at \$21,600 (total)
- IBM language arts, mathematics, and grade-recording software packages for Becker and Harris Elementary Schools, and science software used for training, valued at \$7,000
- IBM labs for the training donated by principals Betty Jo Hudspeth from Andrews Elementary School and Kent Ewing from Bowie High School
- In-kind donations (workshop trainers), valued at \$10,200

## **CURRICULUM DEVELOPMENT**

### **The Planet Earth Curriculum**

The Planet Earth is an integrated science curriculum for the tenth grade written by Science Academy teachers working individually and together during the summer of 1991. The materials were then combined to create an interdisciplinary course that included geology, physics, earth science, chemistry, and biology. A Technical Advisory Committee was closely involved in the development of the curriculum.

### **The Planet Earth Technical Advisory Committee**

#### **Educators**

Steve Grand, Ph.D.  
Assistant Professor, Dept. of Geosciences,  
The University of Texas at Austin

Kenn Heydrick, Ph.D.  
Curriculum Coordinator, Austin ISD

Roger Lee  
U.S. Geological Survey. Ph.D. candidate,  
Geosciences (The University of Texas at  
Austin)

Leon Long, Ph.D.  
Professor, Dept. of Geosciences,  
The University of Texas at Austin

Irwin Spear, Ph.D.  
Professor of Botany,  
The University of Texas at Austin

#### **Radian Corporation**

H. David Balfour, Ph.D.  
Chemistry Division Manager

Ron Nelson  
Program Manager of Corporate Operations

#### **Science Academy Staff-Writers**

Arthur Brenner  
Teacher: Physical Science, Physics, and  
Chemistry

Gail Carmack  
Teacher: Biology, Chemistry, and Marine  
Science

David Journeay  
Teacher: Biology, Physiology, and Chemis-  
try

Mary Long  
Curriculum Coordinator

Kathy York  
Teacher: Chemistry, Geology

#### **Science Academy Staff-Consultants**

Wesley Halverson, Ph.D.  
NSF Project Facilitator/Teacher: Environ-  
mental Science, Biology, and Chemistry

Laura Moss  
Teacher: Mathematics

Robert Suder, Ph.D.  
Teacher: Chemistry and Astronomy

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## The Nonpoint Source Pollution Curriculum

The Nonpoint Source (NPS) Pollution Curriculum is an integrated science curriculum designed for middle and junior high school students. The curriculum focuses on nonpoint source pollution, which is defined as water pollution not attributable to a specific source such as a factory or water treatment plant.

Development of this curriculum began during the 1990-91 academic year. The objectives for the curriculum were written during the summer of 1990. Over the next nine months the Technical Advisory Committee reviewed the objectives three times and provided input as to content. In the summer of 1991, the curriculum writing workshop was held at the Science Academy during which the curriculum lessons were written. The finished curriculum was reviewed again by the Technical Advisory Committee and was piloted beginning in the fall of 1991.

### The NPS Technical Advisory Committee

#### The Lower Colorado River Authority

Burt Carter  
Environmental Coordinator,  
Environmental Quality

Ed Clark  
Manager, Public Information  
and Customer Relations

Bruce Hicks  
Manager, Water Resources

John Hrcir  
Legislative Liaison, Environmental  
Quality

Quentin Martin  
Manager, Water Resources

Jim Parks  
Project Manager, Water  
Resources

Mike Personett  
Manager, Conservation

Kolleen Wilwerding  
Manager, Environmental  
Quality

#### The Texas Water Council

Hon. Thomas Bowden  
Chairman, San Saba County

George E. Byers, Jr.  
Chairman, Blanco County

John Dickerson III  
Member, Matagorda County

Robert Dumbeck  
Member, Bastrop County

Dan Gertson  
Chairman, Wharton County

Charles H. Ingram  
Member, Llano County

Hon. D.C. Kinchloe  
Chairman, Burnet County

Gene Kruppa  
Chairman, Fayette County

Hilda Ollman  
Member, Travis County

Taylor Ollman  
Member, Travis County

Charles Trefney  
Chairman, Colorado County

#### Other Agencies

Clyde E. Bohmfalk  
Director, Water Quality  
Division, Texas Water  
Commission

Don Cook  
Director of Special Programs,  
General Land Office

Donna Darling  
Director, Public Information  
Specialist, Texas  
Water Development Board

Michael Liday  
Environmental Quality  
Specialist, City of Austin

Mark Wieland  
Executive Director, Clear  
Clean Colorado River  
Association

Max Woodfin  
Agricultural Resource  
Protection Division, Texas  
Department of Agriculture

**Educators**

Dan Arigona  
Policy Research Clearing-  
house, Texas Education  
Agency

Phillip Bennett, Ph.D.  
Professor, Geological  
Sciences, The University  
of Texas at Austin

Jim DeWitt  
Administrative Assistant,  
San Saba ISD

Sally Diederich  
Science Teacher,  
Palacios ISD

Mary Gurno  
Curriculum Director,  
Burnet Consolidated ISD

Kenn Heydrick, Ph.D.  
Curriculum Coordinator,  
Austin ISD

Susan Kemp, Ph.D.  
Curriculum Coordinator,  
Austin ISD

Marsha Lyons  
Curriculum Coordinator,  
Austin ISD

Patricia Mendoza  
Science Teacher,  
Austin ISD

Judith Robbins  
Curriculum Coordinator,  
Llano ISD

Alice Roberts  
Science Teacher,  
Austin ISD

Elgin Schilab  
Curriculum Coordinator,  
Austin ISD

Mary Jane Schott  
Education Specialist (Science),  
Texas Education Agency

Erwin A. Sladek, Jr.  
Director of Instruction,  
La Grange ISD

Barbara Taylor  
Science Teacher,  
Austin ISD

Mary Leigh Wolfe, Ph.D.  
Professor, Agricultural  
Engineering, Texas A&M  
University

**Science Academy Staff-  
Consultants**

Gail Carmack, Teacher:  
Biology, Chemistry,  
Marine Science

Wesley Halverson, Ph.D.,  
Project Facilitator/Teacher:  
Environmental Science,  
Biology, Chemistry

Mary Long, Curriculum  
Coordinator

Sue Sinkin-Morris, Direc-  
tor

**Donations**

- The LCRA gave \$7000 in supplemental funds as part of a partnership donation to the Science Academy to hire 10 teachers to write the curriculum during the summer of 1991.

**Additional Activities**

- The Texas Water Commission has expressed interest in statewide dissemination of the NPS curriculum.
- The NPS curriculum's scope and sequence was used by the Texas Education Agency (TEA) as an example of a new thematic approach to science education in Texas middle schools.

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## ***The Colorado River Watch Network***

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### **The Lower Colorado River Authority Partnership**

In partnership with the Science Academy, the Lower Colorado River Authority (LCRA) coordinated the following activities:

- The River Watch Training Institute, a three-day training workshop held each summer to train teachers to conduct water quality monitoring. Teachers were then to form water monitoring teams with their students as part of the NSF grant activities beginning in the 1991-92 academic year.
- The "Trouble Shooting" Workshop, a one-day follow-up workshop held twice a year to bring previously trained teachers together to exchange ideas, discuss problems, and develop action plans to resolve problems.
- The Student Symposium, a one and a half-day symposium held each spring to bring students and teachers together for student presentations and to exchange data, evaluate the year's program, and plan the next year's activities.

### **Donations**

The Lower Colorado River Authority (LCRA) has increased its grant partnership donation from \$60,000 (1990) to \$108,000 per year (1991-92). These funds include:

- Funding for the above-mentioned workshops,
- In-kind donations for two LCRA staff persons who assist in the planning of workshops, conduct citizen training, manage the water quality testing data, and supervise two student interns from the Science Academy,
- Two Macintosh computers with on-line connections to the U.S. Environmental Protection Agency (EPA),
- Salaries for two Science Academy students employed as summer interns, and
- Costs of managing the database.

### **Additional Activities**

- The Colorado River Watch Foundation, Inc. (501-c3), a coalition of environmental organizations including the LCRA, the Clear Clean Colorado River Association (CCC), the Lake Travis Association, and the City of Austin, was formed to raise funds to provide long-term support for the Colorado River Watch Network.
- In January of 1991, the Texas Water Commission formed a new organization called Texas Watch. The purpose of this organization is to support citizen water monitoring efforts and to expand the River Watch Network statewide.

## ADDITIONAL LINKAGES

### The Texas Department of Health

The Texas Department of Health provided a grant to Keep Texas Beautiful for \$350,000 to develop new K-12 curricula and disseminate solid waste curricula statewide to 2,000 teachers the first year. During the summer of 1991, the Science Academy hosted a workshop during which six teachers from around the State reviewed and modified the Keep America Beautiful curricula (Waste In Place and Waste: A Hidden Resource) for Texas schools.

A scope and sequence outline and 27 lessons were written for two curriculum guides. In January of 1992, 40 teachers from throughout Texas were trained in the curriculum. During the spring and summer of 1992 these teachers will in turn train other teachers in their schools.

#### Science Academy Staff-Consultants

|                         |                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------|
| Wesley Halverson, Ph.D. | NSF Project Facilitator/Teacher: Environmental Science,<br>Biology, and Chemistry |
| Sue Sinkin-Morris       | Director, Science Academy                                                         |

### The Environmental Connection: Austin

The Environmental Connection is a nonprofit environmental education organization formed in affiliation with the National Alliance for Environmental Education for the purpose of promoting environmental education. Science Academy staff helped to establish the Austin affiliate and participated in the following activities:

- Establishing an Austin clearinghouse for environmental materials and computer linkage to other centers around the country on the ECONET system (a computer bulletin board system that allows computer linkages with other environmental organizations worldwide).
- Sponsoring an Environmental Education Forum at Region 13 (Education Service Center) in the spring of 1991 for teachers and students, and publishing a summary report of key note recommendations and planning statements for environmental education in the Austin area.

### Grants

- A grant from the City of Austin for \$82,500 in conjunction with the Water and Wastewater Department of the City of Austin. Ninth- and tenth-grade "at-risk" students will be paired with experienced River Watch students to form water monitoring teams in a effort to improve the academic achievement and reduce dropouts among the ninth- and tenth-grade participants.
- A \$400,000 Kellogg grant to the Austin Creative Rapid Learning Center. This project will involve high school dropouts and water quality testing.
- A grant of \$3,000 from the Radian Corporation for a needs assessment seminar to study ground water problems and issues. This will be a joint project between the Science Academy, Huston-Tillotson College, and The University of Texas Department of Civil Engineering.

- 
- A grant of \$5,500 to the LCRA from Region 6 of the EPA to hire two Science Academy students to produce a slide show on nonpoint sources of water pollution for the North American Lake Management Society (NALMS) conference in Denver, Colorado.
  - The CCC hired two former Science Academy students using a \$3,000 Patagonia grant (a private foundation grant) and \$2,000 from the Environmental Department of the City of Austin.

### Donations

- Water monitoring apparatus (Surveyor II) valued at \$6,940 was donated to the Science Academy by Hydrolab Corporation of Austin under the direction of Mr. Jim Flynn (V.P. Marketing).
- Tamara Saltman, a Science Academy student won second place in a grant writing contest sponsored by HEB Grocery Stores. The award of \$1,500 has been used to purchase advanced water monitoring equipment. Selection of winners was by the Texas General Land Office.

### Pending Grants and Proposals

- A \$150,000 grant (\$50,000 a year over the next three years) from the Texaco Foundation will support several aspects of the NSF grant activities.
  - A summer session for elementary students will be held each summer so that teachers who attended the NSF training institutes can practice the science, mathematics, and technology lessons learned during those institutes. Funding will also include equipment to assist in the elementary instruction.
  - A summer session for science and mathematics instruction will be held for middle school students.
  - The Science Academy will receive equipment to assist in technology instruction.
- A \$25,000 grant proposal has been submitted for a joint teacher training project between the LCRA and Region 6 of the (EPA). Prior to the dissemination of the NPS curriculum throughout the 10-county LCRA area, teachers will attend a two-day summer workshop and a follow-up workshop to train them in the implementation of the NPS curriculum.
- A proposal is in motion for a joint effort between the Texas Water Development Board, TEA and Optical Data Corporation (a private company that produces laser discs and CD-ROMs) to explore the feasibility of putting the NPS curriculum on CD for use on a CD ROM.
- A grant proposal to the Austin Community Foundation (written in conjunction with the City of Austin-Environmental Department) for \$11,700 to study water quality problems in Austin's Town Lake.

# **Austin Independent School District**

## **Department of Management Information**

**Dr. Glynn Ligon, Executive Director**

### **Office of Research and Evaluation**

#### **Systemwide Evaluation**

**David Wilkinson, Evaluator**

#### **Author:**

**Lydia Williams-Robertson, Evaluation Associate**



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